

Title (en)  
Adaptive predistortion control for optical external modulation

Title (de)  
Adaptive Vorverzerrungsschaltung für optische externe Modulation

Title (fr)  
Circuit de prédistortion adaptative pour modulation externe optique

Publication  
**EP 0849897 A3 20031210 (EN)**

Application  
**EP 97120619 A 19971125**

Priority  
US 76969296 A 19961218

Abstract (en)  
[origin: EP0849897A2] An external modulation fiber optic transmitter includes an optical source, a predistorter for generating a distortion cancellation signal in response to a radio-frequency input, an electro-optic modulator for modulating the optical signal in response to the distortion cancellation signal, and an adaptive predistortion control circuit for providing a predistortion control signal to the predistorter. The adaptive predistortion control circuit includes a receiver for receiving the modulated optical signal output by the modulator, a filter for filtering the intermodulation distortion from the modulated optical signal to obtain a first distortion component, a distortion generator for receiving the radio-frequency input signal from the predistorter and generating a second distortion component in response to the radio-frequency input signal; a mixer for synchronously demodulating a product of the first and second distortion components to obtain a correction signal; and a lowpass filter and integrator for generating the predistortion control signal in response to the residual intermodulation distortion in the output of the electro-optic modulator. The predistorter modifies the distortion cancellation signal in response to the predistortion control signal, thereby reducing distortion of the modified optical signal. Similarly, a method of adaptive predistortion control for optical external modulation includes the steps of generating a predistortion control signal; modulating an optical signal using the predistortion control signal; transmitting the modulated optical signal; receiving the modulated optical signal; filtering the modulated optical signal to obtain a first distortion component; generating a second distortion component using the predistortion control signal; synchronously demodulating a product of the first and second distortion components to obtain a second order correction signal and a third order correction signal; integrating the second order correction signal to generate a modulator bias control signal; and integrating the third order correction signal to control parameters of the predistorter, thereby modifying the predistortion control signal in response to the modulator bias control signal to reduce distortion of the modulated optical signal.

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Citation (search report)  
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• [A] EP 0475376 A2 19920318 - GEN INSTRUMENT CORP [US]  
• [A] GB 2293022 A 19960313 - TOSHIBA KK [JP]  
• [A] NAZARATHY M: "PROGRESS IN EXTERNALLY MODULATED AM CATV TRANSMISSION SYSTEMS", JOURNAL OF LIGHTWAVE TECHNOLOGY, IEEE. NEW YORK, US, vol. 11, no. 1, 1993, pages 82 - 104, XP000377989, ISSN: 0733-8724

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